

The apparatus includes a series active continuous time voltage regulator operating in conjunction with a alternating current power source and one or more loads. The alternating current power source is a voltage source that induces currents at a first end of the apparatus. At a second end of the apparatus one or more loads consume power from the apparatus. The series buck-boost regulator is composed of a pure monochromatic voltage source of frequency equal to that of the alternating current power source, and of constant phase with respect to the alternating current power source. The regulator is further composed of a sampling network that provides a scaled continuous time sample of the voltage delivered by the power conditioner to the loads. Finally, the regulator is composed of a high gain differential amplifier. The components of the regulator are configured to operate as a continuous time feedback control system that generates an error correction voltage that, when added to the voltage of the alternating current power source, results in an output voltage from the power conditioner that is a scaled replica of the monochromatic reference voltage. As a result, the voltage delivered by the power conditioner to the loads is substantially corrected of spectral impurities and impervious to the specific conditions of the alternating current power source or of the loads.